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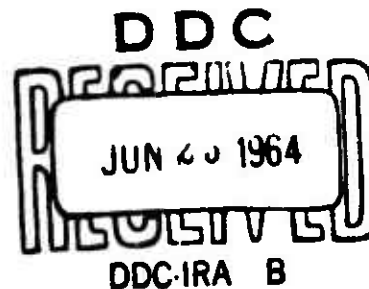
Changes in Perception of and Emotional Response to Stimuli  
as a Function of Pairing with Positive Affect

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A B S T R A C T

This study was designed around McClelland's description of the process of motive formation. A motive is formed by pairing an object (stimulus) with either the arousal of, or a stable state of positive affect. We attempted to arouse positive affect by (1) monetary reward, (2) relief from cold press, and (3) verbal reinforcement in a test of social perception. In each of these treatments the subject was brought into contact with some pictures of people during the arousal of positive affect.

Our general hypothesis was that these pictures would come to reintegrate the positive affect in the subject when he viewed them later. We also expected that this emotional response would affect the subject's behavior toward the pictures. The specific hypotheses were (1) the subject would spend more time looking at a treated picture (associated with positive affective-arousal) than an untreated picture, (2) in the stereoscope the subject would have a greater tendency to see a treated picture as "standing out" over an untreated picture in binocular rivalry with it, and (3) the subject would rate his emotional reaction to the pictures as being more positive than the baseline set by pre-treatment ratings.

The results were equivocal despite one supporting finding. The failure to obtain the predicted results was attributed to underestimating the requirements for associating (attaching) positive affect to previously neutral stimuli. The study was interpreted as defining some of the limits to the conditions for learning within the framework of affective-arousal theory.

## CHAPTER I

### INTRODUCTION

The purposes of the present study were (1) to experiment with some methods of inducing positive affect and (2) to associate positive affect with pictures of people. The consequences of the affect arousing treatments were evaluated by changes in stereoscopic perception, eye movements, and rating of the treated pictures.

McClelland's (1953) discussion of motive formation provided the conceptual paradigm for this study. His definition of motive includes both the object and a state of positive affect redintegrated by the object. All motives are learned. They are learned by the pairing of the object (stimulus) with either the arousal of, or a stable state of positive affect. This statement of the process of learning motives furnished the guidelines for the present study.

Drive reduction theory has some parallel conceptions that make the same predictions as affect theory in many contexts. With respect to the present study, it could be said that instead of arousing affect we were reducing drives. We would then have been associating pictures of people with anticipatory goal responses instead of positive affect. However, Hilgard (1963) points out that drive reduction theory does not satisfactorily explain approach behavior that leads to increased arousal. This presents no problem for affective-arousal theory, since positive affect, which may result

from either decrease or increase in arousal ("drive"), is seen as an accompaniment or determinant of approach behavior (Izard, 1959, 1960; Murphy, 1956). We wanted to examine some of the effects of positive affect derived from conditions of both increasing and decreasing arousal.

Vernacular theory is replete with suggestions for arousing positive affect in people. Examples are giving money, giving candy to children, making a cold person warm, approving of the person, providing success experiences for them, etc. In addition, receiving social approval and satisfying a need for achievement have been singled out more formally by McClelland as occasions for positive affect. Fiske and Maddi (1961) hypothesized that a person feels positive affect while high arousal is in the process of dropping to its normal level.

Several studies have demonstrated the effects of positive affect on behavior. Schutz and Naumoff (1963), Izard et al. (1963), and Nunnally et al. (1963) have shown that objects associated with the arousal of positive affect come to be described in more positive terms. Similarly, feeling toward the object becomes more positive. Verbal evaluation is a face-valid measure of positive affect. Therefore, it lends more support to a construct of positive affect than to a construct of  $r_g$ . By measuring eye movements, Matheny (1962) found that subjects spend more time looking at positively rated stimuli. There are theoretical formulations and research data that suggest that perceptual structure favors percepts which are pleasant

(Allport, 1955; Murphy, 1956). Other studies suggest that affect may play a role in the resolution of binocular rivalry (Izard and Hall, 1962; Jennings and Izard, 1962).

The methodology for the present study, briefly, was as follows. Pre-treatment measures were taken of eye movements and stereoscopic perception for one set of pictures to establish base rates. Subjects also rated their feelings toward the pictures. Then each subject was subjected to one of three affect arousing treatments, during which he was exposed to a second set of pictures which included the "treatment" pictures. After the treatment (affect-picture association), eye movements, stereoscopic perception, and ratings were readministered using the second set of pictures.

Our hypotheses were that after the treatment the subjects would: (1) rate their feeling toward the pictures as being more positive, (2) spend more time looking at a treated picture than at a non-treated picture simultaneously exposed, and (3) would report more perceptions of treated pictures in the stereoscope.

## CHAPTER II

### METHOD

#### Subjects

The subjects were 60 arts and science undergraduate men from introductory psychology courses. The first 20 who volunteered were assigned to the cold press treatment, the second 20 to the social perception treatment, and the third 20 to the roulette treatment.

#### Apparatus

Pictures.--There were 50 pairs of facial photographs, black and white mat prints 2 1/2 inches by 3 1/2 inches. In each pair, both pictures were of the same person, but no two pairs were of the same person. Every pair included both a smiling pose (lips parted) and a neutral pose (pleasant, but lips not parted). The pictures were divided into two sets of 25 pairs each. The sets were matched by the experimenter's judgment for number of males and females, approximate age of the persons, and general attractiveness.

Cold press.--The cold press consisted basically of immersing the subject's foot in ice water for 90 seconds. Following the cold press, the subject rested his foot in the open air for 40 seconds, and then immersed it in warm water for 40 seconds. A set of electrodes were attached to the subject's finger tips, and the wires ran to a set of miscellaneous electronic equipment. This equipment was used

to make the affect arousal treatment look like a measure of physiological arousal.

Roulette game --The "roulette wheel" consisted of a platform on which was mounted an arm that rotated inside a ring of 20 nails. The outcome of a spin was defined by letters in the spaces between the nails--"W" for win, "S" for free spin, and "L" for lose. There were six "W's," six "S's," and eight "L's." Pictures to be treated were placed in the winning spaces, pictures to be simply exposed were placed in the free spin spaces, and the losing spaces were left empty. Four sets of pictures were used yielding a total of 24 treated pictures. On each set, the subject spun until he had won or lost three times, i.e., twelve spins in all, not counting free spins. Whenever the subject won, he was given a dollar. Whenever he lost, he returned a dollar of his winnings. If he had no winnings, he was not obliged to pay, then or later.

Social perception test.--For counterbalancing purposes, there were two social perception tests. Each one consisted of one of the picture sets described above, augmented by several extra pictures. Each "test" was made up in the following manner. One stack of 40 neutral poses were formed by selecting 24 neutral poses (the "treatment" pictures) from one picture set and adding the 25th neutral pose from that picture set, four neutral poses from the other picture set, and eleven neutral poses belonging to neither picture set (16 non-treatment pictures). A stack of 30 smiling poses (also non-treatment) was formed by selecting the smiling poses of the

persons pictured in the neutral stack with the exception that only one of the eleven persons belonging to neither set was included. The instructions emphasized to the subject that his social skill would be reflected by his accuracy in telling whether the persons in the pictures were basically happy or unhappy regardless of their manifest expression. As the subject judged the neutral poses, the experimenter told him that he was correct on each of the 24 treatment pictures. He was told that he was incorrect on the 16 non-treatment neutral poses. The subject received no feedback on his judgments of the smiling poses.

Stereoscope --The stereoscope was similar to one designed by Engel (1956). It contained two separate light-proof compartments, each with separately variable light sources and means for presenting the stimuli briefly. With each pair of pictures the neutral pose was presented on one side and the smiling pose on the other. A mirror system made the pictures appear to the subject to be superimposed thus creating binocular rivalry. As each pair was flashed to the subject, he indicated by saying "Happy" or "Plain" which of the two pictures "stood out" to him.

To control eye dominance, the subject was shown a series of picture pairs, each pair containing a smiling and a frowning pose. The light levels in the two compartments were adjusted until the subject's responses met a criterion. For scoring purposes, the 20 pairs of pictures were divided into five blocks of four pairs each. Eye dominance was considered negligible when out of any two



consecutive blocks, the subject saw only three to five pictures on the same side of the stereoscope.

Eye movements.--The apparatus for measuring eye movements was mounted on a 30 inch by 30 inch table. The subject's head rested in a head rest on the front edge of the table. He looked at the pictures, a pair at a time, mounted four inches apart near the top edge of a 5 inch by 12 inch card. Half the time the smiling pose was on the right side. The order of cards was randomized. The card rested on a rack at eye level 11 inches from the subject's eye. The tip of the lens of a 16 mm. Bolex movie camera rested just above the center of the card. The subject's right eye was photographed at 8 frames per second.

Rating scale.--The rating scale consisted of an 8 point Likert type scale with one end marked "pleasant feeling" and the other marked "unpleasant feeling." The subject was requested to rate the feeling evoked in him as he looked at a picture.

#### Procedure

The first 20 subjects were assigned to the cold press condition. Each subject was run individually. As the subject entered, he was told that he would see several pictures and that to assure his fresh approach to all pictures he would complete the whole procedure twice using only half the pictures each time. One set of pictures was used for all the pre-treatment procedures, and the other set was used during and after the treatment. Before-after

counterbalancing of the two sets was used. The subject was given one of the sets of pictures, and he was told to familiarize himself with them. He saw all of the neutral poses at once and all the smiling poses at once, the order being counterbalanced. He was next moved to the eye movement apparatus. The procedure was demonstrated using five sample slides, and he was told simply to look at the pictures. He was photographed as he looked at 15 slides containing 15 picture pairs from the same set with which he familiarized himself. Each slide was exposed for 7 seconds.

Next, the subject was put through the procedure for controlling eye dominance in the stereoscope. He was told that some pictures would be flashed one at a time in the machine and that his task was to try to perceive each picture so that he could pick it out of a group of four pictures comprising the two pictures just shown in the stereoscope plus two more. Then, he was shown the 25 pairs of the same set of pictures used for eye movements and familiarization. He was told to report whether the person's expression was happy or plain, and he was shown examples of both types of expressions.

For the last step in this phase, the subject filled out the rating scales. He was shown the 25 neutral poses and 10 of the smiling poses from this same set used on the above measures. He rated his response to each picture on the 8 point scale, and he was told specifically to rate the feeling evoked in him by the picture.

After the pre-treatment phase, these 20 subjects were given

the cold press treatment. To disguise the true nature of the treatment, electrodes were attached to the subject's fingers, and he was told that we were measuring his physiological responsivity. During the 80 second warming up period, the subject was told to look through 24 neutral poses of the second set of pictures under the pretext of the need to familiarize himself with them. Half of the subjects "familiarized" themselves with the 25 smiling poses and one neutral pose after the 80 second warm-up period. The other half saw these pictures before the cold press began. Following the treatment, the subject was again administered the eye movement, stereoscope, and rating scale. The same numbers and types of pictures were used in the post-treatment measures as in the pre-treatment measures described above. The set of pictures used in the second round of measures was the same set used with the treatment.

The second 20 subjects were assigned to the social perception treatment. Each subject was given the same general introduction as above. After completing the pre-treatment measures following the procedures described above, he was given the two stacks of pictures made up for the social perception task. He was told that his task was to tell whether the person in the picture was basically happy or unhappy irrespective of the person's manifest expression. The instructions emphasized how important it is to be perceptive. The subject was told that we had norms for the stack of neutral poses, but that norms were not yet available for

the smiling poses. For this reason we could give him feedback on his judgment of the neutral but not the smiling poses. The subject was told his judgment of each neutral pose was correct or not according to the scheme described above. After the "test," the subject again went through the three measures using the treated pictures and following the same procedures as the cold press group. At the end of the session, the experimenter explained to the subject the true nature of the "test."

The third 20 subjects were assigned to the roulette group. Each subject was administered the pre-treatment measures just as the other two groups. Then, the subject was taken to the roulette wheel. He was told that the roulette task was a separate experiment. The rules for playing, collecting a dollar, and paying back a dollar were explained; and the subject was told that he would have to try to learn the pictures and learn whether they were "W's" or "S's." In each of the four groups of pictures around the wheel, the six winners were all neutral poses, and the six free-spin pictures were the smiling poses that went with the neutral poses. After the game was over, the subject was given a stack of pictures from which he had to pick out the pictures used in the game and tell whether they were "W's" or "S's." These data were not recorded. Then, like the other two groups, these subjects again ran through the dependent measures using the pictures employed in the game.

## CHAPTER III

### RESULTS

For each of the three post-treatment measures (stereoscope, eye movement, and rating scale) a separate score was derived using only those responses which involved treated pictures. A comparable set of scores were derived from the pre-treatment measures. A Lindquist, Type III, analysis of variance was applied. Separate analyses were run for the three dependent measures. The within-subjects variable, called "pre-post," refers to the time of measurement, i.e., before treatment versus after treatment. The "treatments" variable refers to the type of affective-arousal treatment. The "order" variable refers to whether the subject was exposed to picture set 1 during the pre-treatment measures and then set 2 during the post-treatment measures or vice versa. The three summary tables (Tables 1, 2, and 3) appear below.

The only significant F was the "pre-post" F for the stereoscope. The subjects reported seeing significantly more neutral poses after all the treatments than before.

TABLE 1  
ANALYSIS OF VARIANCE OF EYE MOVEMENTS

Source	df	Mean Square	F	p
B (order)	1	1456	.909	
C (treatments)	2	1743	1.088	
B x C	2	968	.604	
Error (B)	54	1602		
A (pre-post)	1	2167	2.477	>.05
A x B	1	30	.034	
A x C	2	439	.502	
A x B x C	2	481	.550	
Error (w)	54	875		
Total	59			

TABLE 2  
ANALYSIS OF VARIANCE OF RATING SCALE

Source	df	Mean Square	F	<u>P</u>
B (order)	1	208.0	.757	
C (treatments)	2	482.0	1.754	
B x C	2	409.4	1.490	
Error (B)	54	274.7		
A (pre-post)	1	4.8	.090	
A x B	1	5.6	.106	
A x C	2	33.4	.629	
A x B x C	2	4.5	.085	
Error (w)	54	53.0		
Total	59			

TABLE 3  
ANALYSIS OF VARIANCE OF STEREOSCOPE

Source	df	Mean Square	F	p
B (order)	1	.01	.001	
C (treatments)	2	13.30	.564	
B x C	2	41.86	1.775	
Error (B)	54	23.58		
A (pre-post)	1	42.01	9.039	<.005
A x B	1	15.41	3.316	>.05
A x C	2	3.06	.658	
A x B x C	2	6.01	1.293	
Error (w)	54	4.65		
Total	59			



## CHAPTER IV

### DISCUSSION

The results failed in all but one instance to support the hypotheses, and this single supporting finding may have been an artifact brought about by certain features of the task itself (stereoscope). There were some indications that the attempt to control for eye dominance was not completely successful. Also, the procedure may have given the subjects a set to perceive neutral pictures in the post-treatment measure. However, the difference between the pre-treatment and the post-treatment measure was significant. A replication including a control group which receives the measures, but not the treatment, would be desirable.

The most likely reason for failure to obtain the predicted results for eye movements and ratings is that we took the process of associating affect with cues too lightly. After observing the subjects, three faults seem apparent. First, we used so many stimuli that the subject could not assimilate them. Consequently with few exceptions he did not even learn which stimuli he had seen during the treatment. Second, the procedure failed to make obvious the contingency between the picture and the affect. It was not clear that the picture and the positive affect "went together." Third, because of the large number of stimuli, no stimulus was paired with

the affect more than a few times, often not more than once.

McClelland said that through being paired with the arousal of, or with a state of positive affect, stimuli would acquire the ability to reintegrate the positive affect by themselves. But, his writings and his work with respect to motive formation have not included specification of the parameters involved in actually pairing stimuli with the evocation of positive affect such as we did. Our study may be conceived of as setting some procedural limits for establishing a motive by pairing affective arousal and stimulus.

Future studies should swing to the opposite extreme. One procedure might pair a few, well defined stimuli many times in such a way that it is clear to the subject that the presence of the stimulus and the presence of positive affect "go together."

## CHAPTER V

### SUMMARY

The study was designed around McClelland's description of the process of motive formation. A motive is formed by pairing an object (stimulus) with either the arousal of, or a stable state of positive affect. We attempted to arouse positive affect by (1) monetary reward, (2) relief from cold press, and (3) verbal reinforcement in a test of social perception. In each of these treatments the subject was brought into contact with some pictures of people during the arousal of positive affect.

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